



How edge computing can unlock the Metaverse

Edge computing can help unlock the potential of the Metaverse by providing a distributed compute architecture that can support low latency, high bandwidth experiences. It can also help to reduce to improve the experience of virtual reality applications through reducing the cost and discomfort associated with wearing an AR/VR headset.

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What is the Metaverse?

This is the question that many people are still asking, and there is today a lack of clarity within the market. More in-depth analysis of this has been completed in our report [The three telco Metaverse strategies](#) but for the purposes of this article we will define the Metaverse as “a collection of technologies, including the internet and AR/VR, which allows people to interact digitally, in a 3D-model of the internet.” Estimations of the potential value of the Metaverse and its applications vary, however according to a 2021 [Bloomberg Analysis prediction](#), the Metaverse revenue opportunity could be worth an estimated \$800 billion by 2024.

What are the obstacles to Metaverse’s success?

Overall, the success of the Metaverse is dependent upon its scale, i.e how many users it attracts, just like it’s social media predecessors. It’s therefore not a bad strategy to focus on lowering the barrier to entry for potential users and improving their experience.

How edge computing can reduce latency and enable data processing closer to end users

For the Metaverse to provide a truly immersive experience for users, it will require a very large amount of data to be processed at very fast speeds. This is because each user will need to be able to experience and interact with high quality, 3D renderings in real-time. To support this, it is likely that network providers will need to roll out next-generation infrastructure like more fibre-to-the-home.

Edge computing can help to address this challenge to scaling the Metaverse by enabling data processing closer to end users. Instead of networks needing to transport large amounts of both uplink and downlink traffic to centralised cloud locations, much of this data could instead be processed at edge computing locations.

[Intel’s Senior Vice President](#) predicted that we will require a thousand time increase in collective computing power, from current levels, to enable the Metaverse. This is no doubt true – but much thought needs to be put into *where* that computing power is placed and how much is distributed away from the relatively centralised compute architecture that we have today.

One practical reason for the low latency requirements of the Metaverse (the actual figures vary but many predict we’ll need reliable sub 20ms roundtrip latency) is to ensure that users do not suffer from [cybersickness](#), a condition closely related to motion sickness, with symptoms such as nausea and general disorientation. Cybersickness is obviously a significant concern when it comes to AR/VR and therefore Metaverse adoption. Ultimately, users would spend extended periods of time using AR/VR and the higher the latency, the higher the likelihood of them suffering from cybersickness symptoms.

How edge computing can reduce the cost of AR/VR devices

While it will be possible for users to access the Metaverse using existing devices like computers and mobile phones, many believe that the ultimate aim will be to provide truly immersive experiences using AR/VR glasses. Today, however, adoption of these devices is not mainstream – partly because hardware today is still a relatively expensive purchase for a casual consumer. The entry level model of Microsoft’s [HoloLens 2](#) costs \$3,500 USD.

One way to reduce this barrier to entry is to offload compute which is currently built into the headset to a combination of cloud and edge compute infrastructure and charge customers on a subscription basis, giving them access to the Metaverse universe in more of a cloud gaming model. This would allow users to purchase hardware with relatively lower computing capabilities, and therefore a lower price tag.

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How edge computing can improve the user experience for virtual reality applications

On the topic of hardware, offloading compute from the AR/VR device, not only drives down the hardware cost, but it also improves the end-user experience by reducing the weight and increasing the mobility of AR/VR headsets. This may sound somewhat trivial but for a truly immersive and mobile experience, a heavy and burdensome headset just won't do.

Offloading all compute to the cloud is not feasible, not only from a sheer volume of data traffic but also due to latency concerns – this again is where edge computing can play a significant role.

Conclusion

Edge computing in and of itself will not provide the key for scaling the Metaverse. In fact, no single technology can solve the technical and commercial challenges that Meta will face. We said the same thing about 5G recently in our article [No, the Metaverse is not the killer app for 5G](#).

However, edge computing can help to solve certain challenges that the Metaverse faces – and, in conjunction with the cloud, will be key to enabling our networks to be able to support the volume and types of traffic that come along with trying to build an interactive, 3D world.

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